(3) This little book, while forming a useful guide to the clinical examination of the blood, contains little that cannot be found in several well-known manuals on this subject. The only novelty, in fact, which we notice in it is the particular technique employed by Prof. Pappenheim. In some respects, indeed, it is lacking. Thus we find no mention of a common method of enumerating the leucocytes by an examination of microscopic fields in the preparation employed for a red-cell count, and there is no connected account of the blood-picture of pernicious anæmia and of the leukæmias. The nomenclature of the blood-cells and their variations is also unusual and difficult to follow by those accustomed to British nomenclature. In some respects the book is interesting reading, *e.g.* Prof. Pappenheim's views on the derivation of the leucocytic cells. The book contains two beautiful coloured plates of the blood-cells and numerous figures in the text.

R. T. HEWLETT.

OUR BOOKSHELF.

The Annual of the British School at Athens. No. xix. Session 1912–1913. Pp. viii+314. (London: Macmillan and Co., Ltd., 1914.) Price 25*s.* net.

THE most valuable contribution to this issue of the annual is the report by Messrs. R. M. Dawkins and M. L. W. Laistner on the famous Kamares Cave in Crete. This has been known for more than twenty years as a prehistoric sanctuary, but its complete investigation was carried out only in 1913 under the auspices of the British School at Athens. The early fame of the cave was due to the discovery in the early 'nineties of a number of vases and a few figurines. The work has now been successfully accomplished under considerable difficulties. The general result is that the votive objects which form so striking a feature of other caves and mountain sanctuaries in Crete—the libation tables of Psychro, the shields and bronzes of the Idæan cave, and the figurines of Petsofá—are conspicuously absent. The question then arises whether the Kamares Cave was really a sanctuary or only a shelter. The writers conclude that its position renders its use as a shelter improbable; the finds themselves, if they do not positively suggest a sanctuary, equally negative the idea of a dwelling, because houses of the Bronze Age in Crete invariably yield obsidian, while not a single flake was found in this cave. The pottery, again, does not suggest domestic uses. On the other hand, the restricted range of the pottery shapes suggests a sanctuary in which votive vessels were deposited. The cave, in short, was probably a sanctuary of the tutelary divinity of the mountain.

Another side of the subject is illustrated by a report in the same issue of the Journal by Dr. J. Hazzidakis, of an early Minoan sacred cave at Arkalokhori. Here some interesting vases were unearthed with remarkable bronze swords or daggers. Double axes, undoubtedly symbols of the deity worshipped by the Cretans in the prehistoric period, lead to the conclusion that during the whole of the long period of the Bronze Age, the Minoan periods of Sir A. Evans, the Cretans practised one and the same cult, and this is as much as to say that they were, all through, one and the same people.

The Fauna of British India, including Ceylon and Burma. Edited by Dr. A. E. Shipley, assisted by G. A. K. Marshall. Orthoptera (Acridiidæ). By W. F. Kirby. Pp. ix+276. (London: Taylor and Francis, 1914.) Price 10*s.*

THE lamented death of Mr. W. F. Kirby left his memoir on the locusts of British India not quite completed. So far as completion was possible it has been effected by the kind offices of Mr. C. O. Waterhouse, who has compiled many of the diagnostic keys. The memoir, which is an admirable piece of systematic work, deals with no fewer than 329 species of Acridiidæ.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Wet Bulb Temperature and Climatology.

IT is rather disappointing to find, according to your report of the proceedings of the Section of Physiology of the British Association, the discussion upon climate had to be abandoned because no one was prepared to follow up Prof. Osborne's contribution to it. For the points raised by Prof. Osborne, according to what we gather from your short report (p. 322), are of great and vital interest. He emphasises the importance of the readings of the wet-bulb thermometer as indications of what one might call the evaporative quality of the atmosphere as it affects the economy of the human body. Unfortunately the wet-bulb thermometer is untrustworthy for several reasons, and it is well known that physicists treat it with scant respect. Its indications depend in an uncertain way on the physical condition of the air surrounding it, and no one has been able to give a satisfactory method of deducing from its readings the value of the vapour pressure of the atmosphere. Recent experiments of ours with the Kata thermometer prove beyond question that the rate of evaporation from the skin depends directly on the defect of the actual vapour pressure in the surrounding air from the vapour pressure in contact with the skin, and the value of the air vapour pressure can be determined very easily by means of a couple of readings of the dry and wet Kata thermometer.

In order to investigate fully the relation between the climatological condition obtaining in different parts of the United Kingdom and the cooling and evaporative power of the air as measured by the Kata thermometer, we would welcome the help of

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volunteers in town and country districts, who would take daily readings with the Kata thermometer, according to directions accompanying each instrument, which we would supply. The time for taking an observation need not be more than five or six minutes. Full details of the Kata thermometer, its construction and use appear in Dr. Hill's Report of Ventilation recently published by the Local Government Board. If any of your readers are interested enough in the matter to take these readings we should be glad if they would communicate with us.

LEONARD HILL.
MARTIN FLACK.
O. W. GRIFFITH.

London Hospital Medical College,
London, E.
December 7.

Forests and Floods.

IN the issue of July 16 NATURE published a letter on the above subject in which I showed that pulverised soil holds more of the rainfall than the same soil after it is consolidated by time and rainfall, and it was pointed out that trees by the growth of their roots prevented the consolidation of the soil, and so enabled forest lands to retain more of the rainfall than undisturbed ground.

In that letter it was mentioned water passed more quickly through consolidated soil than through the same soil after it is pulverised. I have recently had an opportunity of observing how this peculiarity of dry soil acts in its disposal of the rainfall. In this district we had a very dry autumn; there was only 0·43 of an inch of rainfall in the 37 days extending from September 18 to October 24. The soil in the part of the garden to be referred to is of a light and sandy nature, and became very dry, though the plants seemed to get enough moisture for their requirements. The soil at the surface and to a depth of at least one foot seemed to be very dry. Before the end of the drought there were some cold nights, and the surface began to look more moist; this would probably be caused by the condensation of the rising vapour in the cold surface soil. When the rain began on October 25 the surface was thus in a good condition for absorbing it, and as the rainfall was never at any time heavy, and was well distributed over the eight days, during which 1·5 inches fell, none of it would run off the surface, as even during very rapid rainfalls the water easily enters that light soil. A day or two after the rain had ceased I was putting in some bulbs in the border, and was much surprised to find that below a depth of a little more than 3 inches of damp soil all underneath was as dry as it was before the rain began; while I find from tests made with soil lifted from the border, dried and broken up, that 1·5 inches of water wetted it to a depth of 6 inches. It was shown in the previous letter that pulverised soil holds a good deal more water than thoroughly wetted consolidated soil, so that the border was only moistened by the rainfall to one half the depth it would have been if all the rainfall had been retained by the upper layer of soil. The water evidently had not gone uniformly through the soil, but had made drainage tubes at certain places through which it had passed underground, leaving parts of the soil dry. This we might expect to happen if the soil was not easily wetted, or there were certain parts where the soil was more prepared to take water than at others. Such parts we might suppose to be those up which the water vapour rose most freely, and would therefore be damper, or the water may have escaped down the outsides of the roots of the plants. Now in well stirred soil there are none of these preferential routes for the escape of the water.

In illustration of these preferential routes one might point to the condition of the soil on vertical cuttings which one sometimes sees where roads are cut through banks, or on any deep cutting made in soil. It will be noticed that these cuttings have no vegetation on them, and that the soil gradually weathers away, leaving an overhanging turf. It will be noticed that the soil on the face of the bank under the turf remains dry, all the summer at least, however heavy the rainfall. The water evidently does not percolate straight to the soil underneath, but takes a preferential route, backwards from the turf, and downwards behind the dry soil. The dry soil seems to reject the water, which prefers to pass through the damp soil behind it. It was noticed at the end of November this year that these banks were still dry though 6·4 inches of rain had fallen since October 25.

Some soils seem to have very little affinity for water, and act very much in the same manner as most substances do towards mercury. For instance, when one watches the seashore on a calm sunny day while the tide is rising one often sees all kinds of dry particles which are much heavier than water floating on the surface; these particles may be sand or other earthy matter. Again, when walking over bare sandy soil one sometimes sees a curious illustration of this objection of dry sand to being wetted. If the weather has previously been very drying and there comes a shower of rain, some of the little hollows in the sand will get full of water, and retaining it as well as if they were made of puddle clay. Of course these cups are very shallow, otherwise the hydrostatic pressure would be sufficient to break the water film between the grains of sand.

However, repulsion of the water by ordinary soils does not seem to explain the passage of the rainfall through the soil without wetting it equally. A small clod of soil from the border referred to was dried, after which it was placed in a shallow vessel in which was less than 1 mm. of water. The clod quickly absorbed the water, raising it to its top surface, which was fully 1 cm. above the level of the water.

It is difficult to explain this preference of the water for certain parts of the soil, where the soil wets so easily on contact with it. Is it possible that the water by sinking a little deeper at certain places comes to exert a kind of negative hydrostatic pressure, and so draw the water from the surrounding area? This, if once started, would have a gradually increasing influence owing to the increasing "head."

The border referred to was opened up at a number of places on November 23, after nearly 4 inches of rain had fallen, and even then there were parts of the soil quite dry a few inches below the surface. It is evident that something is still required to explain these preferential routes of the water in dry consolidated soil. There are none of them in pulverised soil, and this points to the probable advantage in "dry farming" of stirring the soil to a sufficient depth to retain the whole of the rainfall, in addition to the usual practice of stirring the surface soil after rainfall to form a mulch to check its loss by evaporation.

JOHN AITKEN.

Ardenlea, Falkirk, December 5.

On an Apparently Distinctive Character of the Genus Bufo.

ON p. 38 of Mr. G. A. Boulenger's valuable work on the "Tailless Batrachia of Europe" it is stated of the vertebral column of the Anura that "In those forms in which the vertebræ are procœlous the eighth

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